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Relationships Between Anxiety, Stress and Task Difficulty

Richard Charles Evenson

Loyola University Chicago

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RELATIONSHIPS BETWEEN ANXIETY,
STRESS AND TASK DIFFICULTY

by

Richard Charles Evenson

A Thesis Submitted to the Faculty of the Graduate School
of Loyola University in Partial Fulfillment of
the Requirements for the Degree of
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1966

VITA

Richard Charles Evenson was born August 23, 1928, in South Milwaukee, Wisconsin.

He graduated from South Milwaukee High School in 1946, and from the University of Wisconsin in 1955, with the degree of Bachelor of Science.

He began graduate studies at Loyola University, Chicago, in 1962, and became a graduate assistant at that time. In 1965, he became a teaching fellow.

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A large volume of research has appeared during the past fifteen years in which anxiety as a personality characteristic has been related to Ss' performance on various tasks. Reviews by Janet Taylor Spence (1956) and I. G. Sarason (1960) have emphasized the pronounced interest in the concept of anxiety and attempts to measure it, but both reviewers have pointed out the inconsistencies in the results of such investigations. Any attempt to explore these inconsistencies must consider the various theoretical notions that have been developed in connection with numerous "anxiety studies."

Review of the Related Literature

Anxiety has been most usually defined in terms of scores on the Manifest Anxiety Scale or MAS (Taylor, 1953) but often by scores on the Test Anxiety Questionnaire or TAQ developed by S. B. Sarason and his associates (Mandler and Sarason, 1952; Sarason and Gordon, 1953; Sarason and Mandler, 1952; Sarason, Mandler and Craighill, 1952). This latter scale was devised to tap an individual's anxiety reactions to a specific type of situation, particularly course examinations and intelligence tests, as opposed to the more general MAS. I. G. Sarason (1960) has reviewed the arguments for specific vs. general indices of anxiety.

Drive theory of anxiety. The MAS was originally developed to test certain hypotheses about the role of drive (Hull's D) in conditioning (Spence, 1958). The assumption was made that MAS scores reflect Ss' emotionality (and, implicitly, the assumption that they reflect emotionality in the experimental situation) with level of emotionality, in turn,

being related to drive level. Thus anxiety level was proposed as a method of measuring drive, and it was postulated that increased drive level would be related to increased conditioning performance (Taylor, 1951). Subsequent studies on eyeblink conditioning (Spence and Taylor, 1951; Spence and Farber, 1953) supported the hypothesis. There were a number of initial criticisms of the conclusion of the Iowa group. Hilgard, Jones, and Kaplan (1951) and Bindra, Paterson and Strzelecki (1955) suggested that MAS scores are related only to avoidance conditioning. Franks (1961) and Bandig (1957) asserted that MAS scores are related to conditionability only to the extent that it measures extra-version. Jessor and Hammond (1957) have pointed out that the MAS has been employed to establish the validity of the drive construct and simultaneously to establish the construct validity of the scale, a rather circular process.

Farber and Spence (1953) found high-anxious (HA) Ss inferior to low-anxious (LA) Ss in stylus maze performance, however, and suggested that the effect of drive level depends on the characteristics of the task. Investigation of the relationship between the MAS and performance were extended into the area of verbal rote learning, but results (cf. Montague, 1953) suggested that the simple drive formula was inadequate. The Iowa group (Spence, 1956; Spence, 1958; Taylor, 1956) subsequently predicted that HA Ss should perform better than LA Ss on learning tasks in which each stimulus evokes but a single response tendency or in which the correct response is highly dominant, but that LA Ss should be superior to HA Ss on complex tasks in which several competing tendencies are aroused

and the correct response is relatively weak. There has been substantial, although not uniform, confirmation of these predictions under emotionally neutral task conditions (I. G. Sarason, 1960; Taylor, 1956). Hill (1957) notes that, in two-choice learning situations, as Ss' performance rises above chance level the correct response must be strongest thus anxious Ss should perform better. Yet the opposite was predicted and confirmed (Taylor and Spence, 1952; Farber and Spence, 1953). He also points out that whenever, with high drive, an oscillation carries the momentary excitatory potential of the correct response below that of a competing response, the oscillation would have carried it below threshold with low drive. In neither drive state, therefore, would the correct response occur. Since increasing drive raises the correct (strongest) response farther above threshold than it raises the incorrect (weaker) responses, anxious Ss should do better even under these special conditions, contrary to the Iowa group's prediction. Franks (1961) and Jones (1961) are reluctant to agree that response strength is a linear function of drive intensity, suggesting that the Yerkes-Dodson "law" is sufficient to explain the experimentally observed interaction. Saltz and Hoehn (1957) point out that controlling intra-task interference in paired-associate lists may confound intra-task competition with task difficulty. Thus an increase in response competition is accompanied with an increase in list difficulty, and it is debatable which effect is actually being controlled.

Drive stimulus model. Following the initial MAS studies, Child (1954) focused attention on another aspect of the Hullian motivational model, drive stimulus or S_D . Approaching the problem in the light of work done

by Mandler and S. B. Sarason (Mandler and S. B. Sarason, 1952; S. B. Sarason, Mandler and Craighill, 1952; S. B. Sarason and Mandler, 1952) with the TAQ. Child hypothesized that among the responses aroused by the S_D associated with anxiety are those that may be described as task irrelevant. Compared with HA Ss, LA Ss presumably have fewer task-irrelevant responses in their response repertoire. In simple conditioning, the irrelevant response tendencies aroused by S_D in HA Ss are not incompatible with the performance being studied, thus they should perform better than LA Ss due to their higher drive level. In more complex situations, such as verbal learning tasks, irrelevant response tendencies are incompatible with performance on the experimental task. The greater number of irrelevant tendencies in high anxious Ss offset any superiority due to higher drive, thus leading to the expectation that their performance will be inferior to that of LA Ss. In short, anxious Ss are believed to react with achievement-related, anxiety-reducing responses which are largely task inappropriate.

Psychological Stress. Investigations of the interaction of anxiety and psychological stress (cf., failure, ego-involving or threatening instructions) prompted Farber (1955) to emphasize the importance of differentiating between motivation (non-associative) and motivational state (associative characteristics) in formulating theoretical models. A number of studies (Nicholson, 1958; I. G. Sarason, 1956; I. G. Sarason, 1957) utilizing ego-involvement (stress) found significant interaction between anxiety and the motivational variable, emphasize the importance of taking S_D as well as D into account when psychological stress is

introduced. A number of studies (Gordon and Berlyne, 1954; Katchmar, Ross and Andrews, 1958; Lucas, 1952; Triax and Martin, 1957) suggest that HA Ss show a performance decrement under failure conditions, while LA Ss range from slightly superior to slightly inferior.

Child's hypotheses (1954) seem to imply, however, that in any task in which irrelevant response tendencies can interfere with performance, LA Ss should always be superior to HA Ss, with the difference between groups increasing as the degree of psychological stress in the situation increases. Yet in neutral situations, HA Ss have shown the superiority predicted by drive theory in verbal learning with low intra-task interference (Montague, 1953; Ramond, 1953; Spence, Farber and McFann, 1956; Taylor and Chapman, 1955). Taylor (1959) points out, however, that in more stressful situations, HA Ss have exhibited the inferior performance predicted by Child, whatever the degree of intra-task interference. Taylor has proposed a system to integrate the two sets of hypotheses. She suggests a "stress continuum" in which ego-involving instructions are less stressful than failure conditions. Slight stress, according to Taylor, would cause improvement in task attending behavior (explaining the frequently observed improvement in LA Ss' performance) but increased stress impairs performance by calling out task-irrelevant responses. HA Ss have lower thresholds for the arousal of anxiety, thus attenuating their improvement in task attending. Finally, the interaction of D with intra-task competition can be thought of as being masked by S_D effects in stressful situations. Thus HA and LA Ss differ in the excitability of both D and S_D , with the latter evolving irrelevant responses. Taylor

admits that any set of results can be explained by the model: if performance improves with stress, effort has increased; if performance decreases, task-irrelevant responses are responsible; if no difference is found, the two factors have balanced each other. Although the assumption of a non-monotonic relationship between D and performance is a simpler explanation, Taylor finds such a position difficult in view of the positive monotonic relationships found earlier.

Other interpretations of anxiety. A great deal of work has been done in which anxiety has been interpreted as a hysteria-psychasthenia continuum (Deese, Lazarus and Keenan, 1953; Eriksen, 1954; Eriksen and Davids, 1955; Eriksen and Brown, 1956; Truax, 1957) or variations of Eysenck's (1947) two-factor theory. Franks (1961) and Bendig (1957), for example, suggest that MAS scores are related to conditionability only to the extent that they measure extraversion. Most of these approaches suggest that the MAS measures not so much anxiety per se as the type of defences used against anxiety. Taylor (1959) emphasizes the importance of the effectiveness of defence rather than the type of defence employed. She suggests that low scores on the MAS may be produced by individuals who have little to defend against or who have developed an effective defence system. Similarly, Sampson and Bindra (1954) found that neurotics with rigid defences score low on the MAS, while depressives seem to be lacking in ego defence and tend to score high on the MAS. Sarason (1961) found that scores on a "Lack of Protection" scale interacted with threat in a typical anxiety study. Others (cf., Maltzman, Fox and Morrisett, 1953) have shown that HA Ss are very rigid in their approach to problem solving. Further, a negative correlation has consistently

been found between the MAS and the K scale from the MMPI (Matarazzo, 1955), suggesting that anxiety scales are influenced by a response set for "socially desirable" answers.

Not only have there been numerous theoretical approaches to the construct of anxiety, but conflicting evidence for the relationship between anxiety and task performance continues to accumulate (cf., Rosenblum, 1960; Rowley and Keller, 1962; Moore, 1962). Sperber (1964) has obtained results that are not consonant with either the Sarason model or the Iowa position. A number of investigators have obtained data consistent with a hypothesized inverted-U function between activation or drive-level and performance (Malmo, 1959; Easterbrook, 1959).

Factor analysis of anxiety scales. It is possible that anxiety scales are complex rather than simple. If anxiety scales are, in fact, measuring a number of variables, then it is not surprising that experimental results vary from situation to situation and from group to group. Nevertheless, the several factor analytic studies that have been done (Bendig, 1958; 1960; O'Connor, Lorr and Stafford, 1956) on the MAS have generated little research. O'Connor and his associates found factors which they identified as chronic anxiety, increased physiological reactivity to emotional stimuli, personal inadequacy, sleep disturbance and motor tension. Bendig found three of these factors and interpreted them as reflecting loadings on neuroticism and introversion-extraversion continuums. O'Brien (1957) attempted to devise further items that would represent three of these factors: chronic anxiety, personal inadequacy and motor tension.

Statement of the Problem

The inconsistency of empirical results in studies derived from drive-construct models suggests that other motivational states may be influential in task performance, and such states may interact with anxiety and other situational variables. Factor analysis suggests at least three subtypes of anxiety, and the confounding of these subtypes conceivably could account for much of the inconsistency in previous investigations. Further, as Sarason (1960) suggests, it may be the personality of HA Ss that accounts for variation in performance, rather than differences in arousal or drive level. Recently, Walker and Nicolay (1963) have developed the Personal Reaction Schedule (PRS) to measure three subtypes of anxiety: motor tension (M), object anxiety (O) and personal inadequacy (P). The PRS consists of 29 items for each subtype, randomized and pooled with the K-scale of the MMPI. Normative data on 948 university undergraduate students indicates that the distributions are approximately normal, although there is a significant difference between mean scores for males and females on the O-type anxiety. Test-retest reliabilities for subtests and total PRS scores are all between .79 and .87 with a period of five weeks between administrations.

Correlations between PRS subscales and with the MAS suggest that all three subscales measure anxiety, but apparently measure different aspects of anxiety. Of particular interest is the personal inadequacy (P) ~~subtype of the~~ PRS:

"Type P anxiety is characterized by concern that one may not be capable of meeting the difficulties of life. The Person himself feels inadequate and the inadequacy lies within himself. There is a certain helplessness and self-evaluation which may give rise to guilt feelings. The focus of uncertainty is on one's own inadequacy (Walker and Nicolay, 1963, p. 4)."

Sarason (1960) notes that HA Ss are found to be self-deprecatory, self-preoccupied and generally less content with themselves. Erickson and Davids (1955) found high correlations between anxiety and rankings on the trait of optimism-pessimism. The PPS P-scale seems to fit these descriptive personality traits quite well. On the basis of face validity, the P-scale seems a relatively specific measurement of those self-oriented tendencies that are aroused by difficult situations and psychological stress. For the purposes of this study, it is assumed that the P-scale of the PPS measures a relatively stable personality configuration that is related to low defence efficiency and tendencies toward personalized reactions to stress. Thus, it would seem possible to relate predictions to these personality characteristics instead of the more usual drive constructs.

Much of the related literature mentions task behavior of HA Ss which is not always reflected in overall task results. Sinha and Singh (1959) interpret HA performance as "more cautious." Davis (1946, 1948) mentions "over-correcting" behavior. Lorchin and Levine (1957) speak of "defence behavior", and note the greater time needed for "integration of response." Child and Waterhouse (1953) point out that, under stress, frustration may cause performance changes such as withdrawal, change in attack, etc. Sperber (1964) notes the tendency to use avoidance or vigilance as a defence against anxiety. Silverman and Elitz (1956) suggest that anxiety scores measure different techniques of responding rather than different levels of drive. Weiner and Ross (1956) found that anxious subjects had less confidence in their answers. Ruebush (1960) mentions that HA children exhibit cautious and dependent behavior in Rorschach testing. A comparison of Rorschach responses of college

nales rated "high" and "low" in feelings of personal inadequacy (P-scale, PRS) suggests that the P-scale is measuring defensive efficiency and productivity (Evensen, 1962). Thus the approach to the task, or the process within performance, would seem of sufficient importance to measure in relation to anxiety.

Consequently, the following hypotheses are presented:

Hypothesis 1. That scores reflecting feelings of personal inadequacy (P-scale, PRS) will be significantly correlated with errors in a problem-solving task, and that the correlation will increase both with increasing levels of task difficulty and with ego-involving stress conditions.

Hypothesis 2. That HA Ss will perform less well than LA Ss, and that this difference will increase both with increasing levels of task difficulty and with stress.

Hypothesis 3. That HA Ss will be more cautious, i.e., guess less frequently, than LA Ss, and that the difference will increase both with task difficulty and stress.

Hypothesis 4. That the foregoing relationships will be greater for scores reflecting feelings of personal inadequacy (P-scale, PRS) than for scores reflecting general anxiety (T-scale, PRS) due to less confounding of the hypothesized crucial trait: feelings of personal inadequacy.

Method

A 2 x 2 x 3 design was employed in order to study high and low anxious Ss, ego-involving stress and control conditions, and three levels of task difficulty.

Subjects. The Ss were 159 undergraduate students at Loyola University (Chicago) enrolled in four introductory psychology courses. All data was

collected during regular class time, and Ss were not volunteers. Two of the courses met in mid-morning and two in the early afternoon. All four courses were taught by two members of the Loyola psychology department. The Ss included both male and female students, and all were at the freshman and sophomore levels of study. Examination of final grades in the psychology course suggests that ability levels were equally distributed throughout the four courses.

Tests Administered. All Ss were routinely given the Nicolay-Walker Personal Reaction Schedule (Appendix A) during the first meeting of the class, thus scores on all four PRS scales (P, O, M and T) and the K-scale from the MMPI were available for all Ss. Previous research (Edwards, 1957; Fordyce, 1956) had indicated consistent negative relationships between anxiety and set to answer in socially desirable ways, therefore, Ss with K-scores (MMPI) over $M + 2$ SD were eliminated from the design.

The first 60 items from the analogies section of Terman's (1956) Concept Mastery Test (CMT) Form T* were used as the task variable (Appendix B). Although all items are of the same form (multiple-choice analogy completion) they are arranged in order of difficulty as determined by the percent of the total standardization population who passed each item (CMT manual, 1956, p.10). Thus, it was possible to administer the first 20 items as a relatively "easy" task, the second 20 items as a "moderately difficult" task, and the third 20 items as a "difficult" task.

Further, the CMT instructions include a warning to "omit those items that you would have to answer by pure guess", since a correction for "guessing"

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is included in the scoring procedure. For the purposes of this study, special attention was paid to the effect of task difficulty and psychological stress on the approach to the task in the form of "risk taking" or "willingness to guess".

Pilot Study. Since speed and errors have been found to interact in stress and anxiety studies (Lazarus and Eriksen, 1952; Katchmar, Ross and Andrews, 1958), and since anxious Ss have seemed to need more time to integrate their response (Lorchin and Levine, 1957), it was decided to attempt to increase the stress-continuum effect by means of slight time pressure. A pilot-study (N=15) was carried out to determine appropriate time limits for each set of 20 analogies. Ss were given each set (easy, moderate and difficult items) one at a time in consecutive order. The test was administered individually. No time limits were imposed, but Ss were told to work as quickly as possible. Standard instructions for the CMT analogies section were read from the test form.

The results are shown in Table 1, and time-limits of 2'30" for the easy section, 3'30" for the moderate section and 4'00" for the difficult section were chosen for use in the present study.

A further consideration was to determine whether instructing Ss not to guess would unduly reduce the data obtained, especially since each level of difficulty includes only 20 items. The results are shown in Table 2, and it did not appear that the prohibition on guessing restricted the data excessively.

Procedure. One morning and one afternoon class were randomly selected as experimental (stress) groups. The remaining morning and afternoon classes

Table 1

Median Time for completion of 20 CMT analogy items in
pilot study (N=15).

	<u>Items</u>	<u>Median Time Required</u>
Easy	20 Items	2' 47"
Moderate	20 Items	3' 46"
Difficult	20 Items	3' 54"

Table 2

Percentage of unanswered CMT analogy items when pilot study Ss (N=15) were instructed not to guess.

	<u>Items</u>	<u>Percent Omitted</u>
Easy	20 Items	9%
Moderate	20 Items	9%
Difficult	20 Items	20%

were designated as control (non-stress) groups. Psychological stress was defined in terms of ego-involving instructions that were designed to represent a threat to achievement-oriented college students.

The instructor of the experimental groups was sent an inter-office memo to read to both classes, announcing that the Student Personnel Office would be administering a special test to students during the next class meeting in order to complete their records. The author of this study appeared at the following class meeting posing as a representative of the Student Personnel Office. Experimental (stress) instructions were as follows:

"The Student Personnel Office has asked me to administer the test which is being passed around. Please do not open your test booklet. Do not write on the test booklet. You will mark all your answers on the IBM sheet provided. Fill in your name, instructor and section number at the top of your IBM sheet. This is a standard intelligence test, used by many schools to predict academic success. The Student Personnel Office is using this particular test for the first time this year. It will become part of your university records. I will read the instructions on the front of your test booklet with you."

Mimeographed test booklets for the experimental group were titled "Hanson-Beckman Standard Scholastic Intelligence Test - Form A." Standard CMT instructions were reproduced on the first page of the test booklet, with the exception that answers were to be marked on standard IBM answer sheets. On each succeeding page were 20 analogy items of increasing difficulty. Each page was administered as a separate time-limited test sequence.

Test booklets for the Control (non-stress) group were identical with the booklets described above, except that they were titled "Hanson-Beckman Research Test for Engineering Aptitude - Form A". There are no engineering

students at Loyola University. Control (non-stress) instructions were as follows:

"My name is Mr. _____, and I'd like your cooperation in some interesting research we are doing. The test being passed around is still in the process of being developed, and we are gathering standardization data on it. Please do not open your test booklet. Do not write on the test booklet. You will mark all your answers on the IBM sheet provided. Fill in your name, instructor and section number at the top of your IBM sheet. This test is an aptitude test for engineering, based on abstract reasoning. Eventually, it is intended for use as a placement test for high-level engineering jobs in government agencies. Obviously, you are not expected to be able to answer all the questions, but we want you to do your best because we will use college norms as a base-line for further research."

No advance notice was given the Control classes, and the presentation was made on a friendly, informal basis.

Immediately following the completion of the experimental task, Ss in both groups were asked to fill out a questionnaire (Appendix C). The purpose of the questionnaire was to determine if the student had previously heard of the test he had taken, his ideas regarding the purpose of the test, plus qualitative information regarding his test reactions, level of anxiety and self-assessment of performance on the test.

Following the collection of the questionnaires, experimental Ss were told of the true nature of the test as follows:

"I want to thank you for your cooperation and I have a few comments that will relieve any worry you may have over the results of this test. Actually, this test has nothing to do with the Student Personnel Office. It was simply part of an experiment in which we hoped to simulate a real academic testing situation. We do not intend to examine your individual scores at all, but are only interested in various averages for group scores. Naturally, it will not be a part of your college record. In fact, this test was not designed to

predict academic success at all. It was originally designed as a special test for testing gifted young people with IQ's over 140. Since this research project is not completed, it is very important that you do not discuss what I have told you with anyone. I want to emphasize that gossip about the real nature of this test could ruin hundreds of hours of research effort. Thank you again for your cooperation."

Control Ss were told:

"I want to thank you for your cooperation. Since this research project is not completed, it is very important that you do not discuss the nature of the test with any of your friends. I want to emphasize that gossip about the test could ruin hundreds of hours of research effort. Thank you again for your cooperation."

Of 164 Ss taking the test, four were dropped because they had participated in the pilot study and one was dropped because of language difficulty. None of the remaining 159 Ss indicated any knowledge or suspicion of the true nature of the test. Useable data included 74 experimental Ss and 85 control Ss.

Results

The following scores were obtained for all Ss:

1. PRS P-score (feelings of personal inadequacy).
2. PRS T-score (general anxiety).
3. Number of incorrect answers (errors) for easy, moderate, difficult and total items.
4. Number of omitted answers (omissions) for easy, moderate, difficult and total items.
5. Number of wrong answers (errors plus omissions) for easy, moderate, difficult and total items.

Pearson product-moment correlations were calculated between P-scores and errors, omissions and total wrong at each level of difficulty. These correlations, for both control and experimental conditions, are shown in Table 3. Correlations between T-scores and the same task variables are shown in Table 4.

Next, Se were dichotomized into Hi-anxious and Lo-anxious groups on the basis of PRS P-scores, pooling the experimental and control data, in order to test for differences in total items wrong at varying levels of difficulty between groups differing in feelings of personal inadequacy. The results, presented in Table 5, show no significant differences.

Table 6 shows that, similarly, there were no significant differences when Se were dichotomized on the basis of general anxiety (PRS T-scores).

In order to test for differences in task performance on the basis of ego-involving stress, Se were dichotomized into experimental and control groups, regardless of anxiety scores. Table 7 shows no significant differences between groups in total items wrong at varying levels of difficulty.

Since, by inspection, the greatest mean differences are on items of moderate difficulty, a comparison between Hi-anxious and Lo-anxious Se was made for errors, omissions and total items wrong on moderate items only. The results, when Se are dichotomized by PRS P-scores (personal inadequacy) are presented in Table 8, and the differences are not significant.

When Se are dichotomized on the basis of PRS T-scores (general anxiety), however, Hi-anxious Se make significantly more omissions ($p < .05$) than do Lo-anxious Se, as shown in Table 9.

Table 10 compares experimental and control groups for errors, omissions and total wrong on items of both easy and moderate difficulty. On moderately

Table 3

Pearson product-moment correlations between anxiety scores (P-scale, PRS) and errors, omissions and total wrong for analogy problems of varying difficulty under stress and non-stress conditions.

	<u>Control (non- stress) Condition</u>	<u>Experimental (stress) Condition</u>
<u>Easy Items</u>		
Errors	.131	-.014
Omissions	-.029	.003
Total Wrong	.046	-.003
<u>Moderate Items</u>		
Errors	.094	.088
Omissions	.116	.125
Total Wrong	.194	.174
<u>Difficult Items</u>		
Errors	.010	.097
Omissions	-.028	-.004
Total Wrong	-.023	-.007

Table L

Pearson product-moment correlations between anxiety scores (T-scale, PHS) and errors, omissions and total wrong for analogy problems of varying difficulty under stress and non-stress conditions.

	<u>Control (non-stress) Condition</u>	<u>Experimental (stress) Condition</u>
<u>Easy Items</u>		
Errors	.215	-.055
Omissions	.047	-.020
Total Wrong	.179	-.048
<u>Moderate Items</u>		
Errors	.118	.040
Omissions	.128	.155
Total Wrong	.226	.174
<u>Difficult Items</u>		
Errors	.037	.065
Omissions	.010	-.005
Total Wrong	.056	.044

Table 5

Incorrect answers to analogy problems of varying difficulty by Se scoring above (H) and below (Lo) the median on the P-scale of the Personal Reaction Schedule.

	H-Anxious (N=79)		Lo-Anxious (N=80)	
	<u>Mean</u>	<u>Variance</u>	<u>Mean</u>	<u>Variance</u>
Easy (20 Items)	5.04	6.30	5.29	7.41
Moderate (20 Items)	8.42	9.67	7.69	10.05
Difficult (20 Items)	12.40	11.36	12.56	13.71
Total Wrong (60 Items)	25.86	52.00	25.54	59.56

None of the differences shown are significant.

Table 6

Incorrect answers to analogy problems of varying difficulty by ss scoring above (Hi) and below (Lo) the median on the T-scale of the Personal Reaction Schedule.

	Hi-Anxious (N=80)		Lo-Anxious (N=79)	
	<u>Mean</u>	<u>Variance</u>	<u>Mean</u>	<u>Variance</u>
Easy (20 Items)	5.22	6.27	5.13	7.25
Moderate (20 Items)	8.14	9.37	7.72	9.64
Difficult (20 Items)	12.66	8.55	12.43	14.65
Total Wrong (60 Items)	26.32	45.79	25.28	60.20

None of the differences shown are significant.

Table 7

Incorrect answers to analogy problems of varying difficulty by Se in stress (ego-involving) and control (non-stress) conditions.

	Experimental (N=74)		Control (N=85)	
	<u>Mean</u>	<u>Variance</u>	<u>Mean</u>	<u>Variance</u>
Easy (20 Items)	5.45	7.60	4.94	5.92
Moderate (20 Items)	8.01	10.31	8.11	9.04
Difficult (20 Items)	12.26	13.73	12.80	9.60
Total Wrong	25.72	66.42	25.80	215.16

None of the differences above are significant.

Table 8

A comparison of Hi-anxious and Lo-anxious Ss (P-scale, PRS) for errors, omissions and total wrong on 20 moderately difficult analogy problems.

	Hi-anxious (N=79)		Lo-anxious (N=80)	
	<u>Mean</u>	<u>Variance</u>	<u>Mean</u>	<u>Variance</u>
Errors	4.37	5.90	4.16	5.76
Omissions	4.05	9.95	3.52	8.32
Total Wrong	8.42	9.67	7.69	10.05

None of the differences shown are significant.

Table 9

A comparison of Hi-anxious and Lo-anxious Ss (T-scale, FRS) for errors, omissions and total wrong on 20 moderately difficult analogy problems.

	Hi-anxious (N=80)			Lo-anxious (N=79)	
	<u>Mean</u>	<u>Variance</u>		<u>Mean</u>	<u>Variance</u>
Errors	4.16	5.06		4.40	6.39
Omissions	4.28	6.92	*	3.32	8.87
Total Wrong	8.44	9.37		7.72	9.64

* $p < .05$

Table 10

A comparison of errors, omissions and total wrong on easy and moderately difficult analogy problems by Se in stress (ego-involving) and control (non-stress) conditions.

	Easy (20 Items)			Moderate (20 Items)		
	<u>Errors</u>	<u>Omissions</u>	<u>Total Wrong</u>	<u>Errors</u>	<u>Omissions</u>	<u>Total Wrong</u>
Stress (N=74)						
<u>Mean</u>	1.57	3.88	5.45	3.77	4.24	8.01
<u>Variance</u>	1.81	8.32	7.60	3.88	9.70	10.31
Non-stress (N=85)		*		**		
<u>Mean</u>	1.85	3.09	4.94	4.73	3.41	8.14
<u>Variance</u>	2.15	6.70	5.91	6.93	8.31	9.04

* $p < .10$

** $p < .02$

difficult items, stress-Ss make significantly less errors ($p < .02$), and there is a trend for stress-Ss to make more omissions on both easy and moderate items. Errors and omissions, of course, are not independent.

Finally, Hi-anxious Ss under stress conditions were compared with Lo-anxious Ss under neutral conditions. Table 11 presents the results when Ss are dichotomized according to P-scores. Hi-anxious experimental Ss make significantly more omissions than do Lo-anxious control Ss ($p < .05$). Table 12 shows the results of a similar comparison when Ss are dichotomized according to T-scores. Here, Hi-anxious experimental Ss make significantly less errors ($p < .05$) than do Lo-anxious control Ss.

Table 11

A comparison of errors, omissions and total wrong on moderately difficult analogy problems for HI-anxious (P-scale, PRS) Ss in ego-involving stress conditions and Lo-anxious control Ss.

	HI-anxious (N=37)			Lo-anxious (N=43)	
	<u>Mean</u>	<u>Variance</u>		<u>Mean</u>	<u>Variance</u>
Errors	3.69	3.04		4.42	6.47
Omissions	4.80	9.54	*	3.32	7.28
Total Wrong	8.50	9.25		7.74	9.21

* $p < .05$

Table 12

A comparison of errors, omissions and total wrong on moderately difficult analogy problems for HI-anxious (T-scale, PRS) Ss in ego-involving stress conditions and Lo-anxious control Ss.

	HI-anxious (N=37)			Lo-anxious (N=42)	
	<u>Mean</u>	<u>Variance</u>		<u>Mean</u>	<u>Variance</u>
Errors	3.68	3.03	*	4.88	7.39
Omissions	4.97	7.97	**	3.14	7.50
Total Wrong	8.65	9.15		8.02	8.55

* $p < .05$

** $p < .01$

Discussion

The hypothesized superiority of PRS P-scores (feelings of personal inadequacy) over PRS T-scores (general anxiety) in predicting variations in performance under neutral and stress conditions was not supported by the results. In fact, the T-scores appeared to relate more closely to the outcome measures than did P-scores. Particularly surprising was that the expected relationships between performance and anxiety or stress alone were not found in terms of items wrong at any level of difficulty nor for the 60-item task as a whole. Differences in the predicted direction, while small, were nevertheless uniformly consistent. A possible explanation is that the variance reflecting intellectual differences among Ss may have been dominant enough to mask the effects of anxiety and stress variables. Typically, freshman students represent a wide variation in level of intelligence as compared with more advanced students. Further, when the combination of Hi-anxious Ss and stress conditions were compared with Lo-anxious and neutral conditions, larger differences were found, suggesting that the interaction was sufficient to show up despite the masking effect of variance due to intelligence. Ruebush (1960) has found Hi-anxious Ss superior to Lo-anxious Ss at low and medium IQ levels, but inferior at high IQ levels, suggesting that the relationship is not linear. More recently, Paul and Eriksen (1964) have found that the relationship between anxiety and change scores from stressful to non-stressful conditions was not significant unless only the middle 70% of the intelligence distribution was used.

Another factor that might help obscure expected differences is the difficulty level of the task (CMT analogy items) itself. It is possible that the analogy items used increased in difficulty so quickly that errors and omissions

primarily reflected intellectual ability.

One method of sharpening the anxiety comparisons is to exclude those Ss in the control condition who nevertheless feel anxious (cf., Paul and Erickson, 1964). This has the disadvantage, however, of confounding the anxiety test-score with self-reported anxiety.

The hypothesis, in this study, that anxiety would be related to "caution-ness" or "avoidance responses" in terms of reluctance to guess at answers, was supported for items of moderate difficulty. Unexpectedly, a similar effect was found as the result of stress alone. Even more significant, Ss in stress conditions were found to be better able to avoid errors in attempted answers. It is true, of course, that a Ss who omits more items is more likely to be correct on the items that are attempted, but although anxiety also increases caution or reluctance to guess, anxious Ss do not show the error reduction as do Ss in stress conditions. Stress, in fact, seems to be the dominant factor, since anxious experimental Ss exhibit both more omissions and less errors. It is apparent that the opposing trends of "more omissions" and "less errors" cancel out, resulting in no difference in total items wrong between groups. These findings are consonant with a study by Raebush (1960) in which highly cautious Ss (identified on the basis of their approach to guessing) did better on imbedded figure problems than did less cautious Ss.

The significant differences obtained in this study, however, provide empirical support for the importance of investigating process effects or Ss approach to the problem rather than the end results of performance measures alone. The implications of this study are that both stress and anxiety induce a cautious approach to the task, but that stress, unlike anxiety, appears to facilitate error reduction.

The results also suggest that other motivation factors (cf., level of aspiration, need for achievement) may be operative in stress-task situations such as in this study. There appears to be a real need to study a broader motivational complex than is typically investigated in anxiety studies. The vast "anxiety" literature itself touches on a number of variables that may be pertinent. Sarason (1960) suggests that performance of HI-anxious and Lo-anxious Ss is dependent on perceived personal threat. Ruebush (1960) suggests that the effect of anxiety on performance is mediated primarily by defensive reactions to anxiety. Weiner (1965) has shown that high achievement motivation (n-achievement score minus anxiety score) is reflected by greater persistence and improved performance following failure, while low achievement motivation resulted in the same facilitating effects following success. Sperber (1964) emphasized the importance of Ss' assessment of the importance of the testing situation, as well as the tendency for HI-anxious Ss to use avoidance or vigilance as a defence against anxiety.

The absence of superior predictability for P-scores as compared with T-scores may also be construed as suggesting other pertinent motivational factors. For example, feelings of personal inadequacy seem likely to be related to the various "striving" motives, thus the relationship between P-scores and performance may, as has been suggest for anxiety in general, be an inverted-U function.

Consideration of other motivational variables, of course, may actually culminate in totally different theoretically frameworks than have typically been used in anxiety studies. One example would be Feather's (1965) use of the motive-expectancy-value model in conjunction with measures of anxiety.

In general, then, the results of this study suggest a number of motivational variables in anxiety-stress-task situations, and emphasize the importance of examining task-approach and task-process as well as outcome-measures alone.

Summary

Four introductory psychology classes of male and female freshman and sophomores at Loyola University (Chicago) were given 60 items from Terman's Concept Mastery Test (Form T). Twenty items at each of three levels of difficulty (easy, moderate and difficult) were given to each class, with a time-limit for each section. Two classes received ego-involving (stress) instructions, while two control classes received neutral or non-threatening instructions. Scores on the Mielay-Walker Personal Reaction Schedule (PRS) were available for all Se. The hypothesis that PRS P-scores (a subscale of anxiety reflecting feelings of personal inadequacy) would interact with stress and difficulty to affect performance more significantly than would PRS T-scores (total scale, or general anxiety) was not substantiated. It was also predicted that P-scores would be related to "caution" in terms of reluctance to guess at answers. The hypothesis was supported for items of moderate difficulty, particularly in the stress condition, but P-scores were not more significantly related to this effect than T-scores. Unexpectedly, stress alone was found to be related to reluctance to guess and to the ability to avoid errors in items attempted. Under stress, Hi-anxious Se were better able to avoid errors than were Lo-anxious Se. Possible explanations involving other motivational factors were presented. Expected effects for anxiety or stress alone were not found, and it was suggested that variance due to individual difference in intelligence may have obscured

differences due to anxiety and stress.

References

- Bindra, D., Paterson, A. L., & Strzelecki, J. On the relationship between anxiety and conditioning. Canad. J. Psychol., 1955, 9, 1-6.
- Bendig, A.W. Extraversion, neuroticism and manifest anxiety. J. Consult. Psychol., 1957, 21, 398.
- Bendig, A.W. Identification of item factor patterns within the Manifest Anxiety Scale. J. Consult. Psychol., 1958, 22, 158.
- Child, I.L. Personality. Annu. Rev. Psychol., 1954, 5, 149-170.
- Child, I.L., & Waterhouse, I.K. Frustration and quality of performance: II. A theoretical statement. Psych. Rev., 1953, 60, 127-139.
- Deese, J., Lazarus, R.S., & Keenan, J. Anxiety, anxiety reduction and stress in learning. J. exp. Psychol., 1953, 46, 55-60.
- Easterbrook, J.A. Varieties of control in performance under speed stress. Bull. Marit. Psychol. Ass., 1957, 6, 29-36.
- Eriksen, C.W. Some personality correlates of stimulus generalization under stress. J. abnorm. soc. Psychol., 1954, 49, 561-565.
- Eriksen, C.W., & Browne, C.T. An experimental and theoretical analysis of perceptual defense. J. abnorm. soc. Psychol., 1956, 52, 224-230.
- Eriksen, C.W. & Davids, A. The meaning and clinical validity of the Taylor anxiety scale and the hysteria psychasthenia scales from the MMPI. J. abnorm. soc. Psychol., 1955, 50, 135-137.
- Evenson, R.C. Relationships between Rorschach scores and the Personal Reaction Schedule. Unpublished manuscript, Loyola University, Chicago, 1963.
- Eysenck, H.J. Dimensions of personality. London: Kegan Paul, 1947.
- Farber, I.E. The role of motivation in verbal learning and performance. Psychol. Bull., 1955, 52, 311-327.
- Farber, I.E. & Spence, K.W. Complex learning and conditioning as a function of anxiety. J. exp. Psychol., 1953, 45, 120-125.
- Feather, N.T. Performance at a difficult task in relation to initial expectation of success, test anxiety, and need achievement. J. Pers., 1965, 33, 200-217.
- Franks, C.M. Conditioning and abnormal behavior. In Handbook of Abnormal Psychology, Eysenck (Ed.). New York: Basic Books, Inc., 1961, 457-487.

- Gordon, W.M. & Berlyne, D.B. Drive-level and flexibility in paired associate nonsense-syllable learning. Quart. J. exp. Psychol., 1954, 6, 181-185.
- Hilgard, E.R., Jones, L.V., & Kaplan, S.J. Conditioned discrimination as related to anxiety. J. exp. Psychol., 1951, 42, 94-99.
- Hill, W.F. Comments on Taylor's drive theory and manifest anxiety. Psychol. Bull., 1957, 54, 490-493.
- Jessor, R., & Hammond, K.R. Construct validity and the Taylor Manifest Anxiety Scale. Psychol. Bull., 1957, 54, 161-170.
- Jones, H.O. Applied abnormal psychology: the experimental approach. In Handbook of Abnormal Psychology, Eysenck (Ed.). New York: Basic Books, Inc., 1961, 764-781.
- Katchmar, L.T., Ross, S., & Andrews, T.G. Effects of stress and anxiety on performance of a complex verbal-coding task. J. exp. Psychol., 1958, 55, 559-563.
- Korshin, S.J., & Levine, S. Anxiety and verbal learning. J. abnorm. soc. Psychol., 1957, 54, 234-240.
- Lasarus, R.S., & Eriksen, C.W. Effects of failure stress upon skilled performance. J. exper. Psychol., 1952, 43, 100-105.
- Lucas, J.D. The interactive effects of anxiety, failure and intraserial duplication. Amer. J. Psychol., 1952, 65, 59-66.
- Malmö, R.B. Measurement of drive: an unsolved problem in psychology. In Nebraska Symposium on Motivation, M.R. Jones (Ed.). Lincoln: University Nebraska Press, 1958, 229-265.
- Mandler, G., & Sarason, S.B. A study of anxiety and learning. J. abnorm. soc. Psychol., 1952, 47, 166-173.
- Matarasso, J.D. MMPI validity scores as a function of increasing levels of anxiety. J. consult. Psychol., 1955, 12, 213-217.
- Montague, E.K. The role of anxiety in serial rote learning. J. exp. Psychol., 1953, 45, 91-96.
- Moore, D. Dogmatism and anxiety in the conditioning of verbal behavior. Dissertation Abstr., 1962, 22, 2468.
- Nicholson, W.M. The influence of anxiety upon learning: interference or drive increment? J. Pers., 1958, 26, 303-319.
- O'Brien, M.J. Differential effects of anxiety on problem solving. Washington D.C.: Catholic University American Press, 1957.

- O'Connor, J.P., Lorr, M. & Stafford, J.W. Some patterns of manifest anxiety. J. clin. Psychol., 1956, 12, 160-163.
- Paul, G.L. & Eriksen, C.W. The effect of test anxiety on "real-life" examinations. J. Pers., 1964, 32, 480-494.
- Ramond, C. Anxiety and task as determiners of verbal performance. J. exp. Psychol., 1953, 46, 120-124.
- Resnick, J.H. Reversals in the superiority of performance of high- and low-anxious SS in verbal conditioning. J. Pers., 1965, 33, 218-232.
- Rosenblum, J. Examiner presence, level of anxiety and verbal conditioning. Dissertation Abstr., 1960, 3390.
- Rowley, V. & Keller, E.D. Changes in children's verbal behavior as a function of social approval and manifest anxiety. J. abnorm. soc. Psychol., 1962 65, 53-57.
- Ruebush, B. Interfering and facilitating effects of test anxiety. J. abnorm. soc. Psychol., 1960, 60, 205-212.
- Saltz, E. & Hoehn, A.J. A test of the Taylor-Spence theory of anxiety. J. abnorm. soc. Psychol., 1957, 54, 114-117.
- Sampson, H., & Bindra, D. Manifest anxiety, neurotic anxiety, and the rate of conditioning. J. abnorm. soc. Psychol., 1954, 49, 256-259.
- Sarason, I.G. Effects of anxiety, motivational instructions, and failure on serial learning. J. exp. Psychol., 1956, 51, 253-260.
- Sarason, I.G. Effect of anxiety and two kinds of motivating instructions on verbal learning. J. abnorm. soc. Psychol., 1957, 54, 166-170.
- Sarason, I.G. Empirical findings and theoretical problems in the use of anxiety scales. Psychol. Bull., 1960, 57, 403-415.
- Sarason, I.G. The effects of anxiety and threat on the solution of a difficult task. J. abnorm. soc. Psychol., 1961, 62, 165-168.
- Sarason, S.B., Mandler, G., & Craighill, P.G. The effect of differential instruction on anxiety and learning. J. abnorm. soc. Psychol., 1952, 47, 561-565.
- Silverman, R.E., & Elitz, B. Learning and two kinds of anxiety. J. abnorm. soc. Psychol., 1956, 52, 301-303.
- Sinha, D., & Singh, T.R. Manifest anxiety and performance on problem solving tasks. J. consult. Psychol., 1959, 23, 469.

- Spence, K.W. A theory of emotionally based drive (D) and its relation to performance in simple learning situations. Amer. J. Psychol., 1958, 13, 131-141.
- Spence, K.W. Behavior theory and conditioning. New Haven: Yale University Press, 1956.
- Spence, K.W., & Farber, I.E. Conditionings and extinction as a function of anxiety. J. exp. Psychol., 1953, 45, 116-119.
- Spence, K.W. & Farber, I.E. The relation of anxiety to differential eyelid conditioning. J. exper. Psychol., 1954, 47, 127-134.
- Spence, K.W., Farber, I.E. & Mufson, H.H. The relation of anxiety (drive) level to performance in competition and non-competition paired-associates learning. J. exp. Psychol., 1956, 52, 296-305.
- Spence, K.W. & Taylor, J. Anxiety and strength of the UCS as determiners of the amount of eyelid conditioning. J. exper. Psychol., 1951, 42, 183-188.
- Sperber, Z. Test anxiety and performance under stress. J. consult. Psychol., 1964, 25, 226-233.
- Taylor, Janet A. The relationship of anxiety to the conditioned eyelid response. J. exp. Psychol., 1951, 41, 81-92.
- Taylor, Janet A., & Spence, K.W. The relationship of anxiety level to performance in serial learning. J. exp. Psychol., 1952, 44, 61-64.
- Taylor, Janet A. A personality scale of manifest anxiety. J. abnorm. soc. Psychol., 1953, 48, 285-290.
- Taylor, Janet A., & Chapman, Jean P. Anxiety and the learning of paired-associates. Amer. J. Psychol., 1955, 68, 671.
- Taylor, Janet A. Drive theory and manifest anxiety. Psychol. Bull., 1956, 53, 303-320.
- Taylor, Janet A. Manifest anxiety, response interference and repression. Paper read at symposium, University of Virginia Medical School, April, 1959.
- Terman, L.M. Concept Mastery Test, Form T. New York: The Psychological Corporation, 1956.
- Truax, C.B., & Martin, B. The immediate and delayed effect of failure as a function of task complexity and personalization of failure. J. abnorm. soc. Psychol., 1957, 55, 16-20.

Walker, R.E. & Nicolay, R.C. A reexamination of anxiety: The Nicolay-Walker Personal Reaction Schedule. Unpublished manuscript, Loyola University, Chicago, 1963.

Weiner, B. The effects of unsatisfied achievement motivation on persistence and subsequent performance, J. Pers., 1965, 33, 428-442.

PERSONAL REACTION SCHEDULE

DO NOT WRITE OR MARK ON THIS BOOKLET IN ANY WAY. YOUR ANSWERS ARE TO BE RECORDED ONLY ON THE IBM ANSWER SHEET.

Print your name, age, birth, sex, etc. in the blanks provided on the answer sheet.

The reaction schedule consists of numbered statements. Read each statement and decide whether it is true as applied to you, or false as applied to you. If a particular statement is true or mostly true as applied to you, blacken between the lines in the column headed T. If the statement is false or not usually true as applied to you, blacken between the lines in the column headed F. Remember, you are to mark your answers on the answer sheet.

Work quickly and remember to give YOUR OWN opinion of yourself. Do not leave any item unanswered.

In marking your answers, be careful that the number of the statement agrees with the number on the answer sheet. Blacken heavily to indicate your answers. If you wish to change any of your answers, erase completely.

PERSONAL REACTION SCHEDULE

1. Most people certainly aren't very helpful.
2. I am capable of handling crises or difficulties.
3. Good guys usually end up last.
4. I certainly feel useless at times.
5. My sleep is fitful and disturbed.
6. I bring a lot of troubles on myself.
7. I usually do better when people leave me alone.
8. When in a group of people, I have trouble thinking of the right things to talk about.
9. I frequently notice my hand shakes when I try to do something.
10. I often miss my opportunities because I don't try hard enough.
11. I would have less trouble today if my parents had been the kind of people they should have been.
12. Criticism or scolding hurts me terribly.
13. I relax as much as others do.
14. My parents expect me to achieve more than I expect of myself.
15. I could probably do better if I had more self-confidence.
16. I find it hard to make talk when I meet new people.
17. Most people can do you more harm than they can help you.
18. In stress situations I like to be physically active.
19. I certainly feel useless at times.
20. I have had very few quarrels with members of my family.
21. The teachers or bosses I have met generally don't demand too much work.
22. If people knew me well, they probably wouldn't think much of me.
23. I perspire no more than most people.
24. I like to let people know where I stand on things.
25. I think tests and examinations are usually fair.
26. I have strong feelings of regret from jobs that I have left unfinished.
27. What others think of me does not bother me.
28. I dislike moving in new social circles.
29. I don't get depressed when I think of the things I should have done.
30. Most people will use somewhat unfair means to gain profit or an advantage rather than to lose.
31. I have been afraid of things or people that I knew could not hurt me.
32. I have periods of such great restlessness that I can't sit long in a chair.

PERSONAL REACTION SCHEDULE

PRS-2

33. I have periods in which I feel unusually cheerful without any special reason.
34. I think I am no good for anything.
35. Most people succeed in this world because of good breaks.
36. At times I feel like smashing things.
37. I don't spend too much time thinking about myself.
38. I am usually lucky.
39. I get mad easily and get over it soon.
40. I am jumpy and irritable in a crisis.
41. Being a leader does not appeal to me because I think someone else can do better.
42. I have never felt better in my life than I do now.
43. Most people will take advantage of you if you let them.
44. When worried, I eat too fast.
45. It takes a lot of argument to convince most people of the truth.
46. I would not judge most people to be more worthwhile than myself.
48. I am not a high-strung person.
49. People often disappoint me.
49. I often feel something dreadful is going to happen to me.
50. My judgment isn't very good.
51. At times I feel like swearing.
52. On the night before a big event I don't have trouble sleeping.
53. When I fail to do well, other people are usually responsible.
54. At periods my mind seems to work more slowly than usual.
55. I will probably never be able to deal effectively with most of my problems.
56. Sometimes I become so excited that I find it hard to get to sleep.
57. I have often met people who were supposed to be experts who were no better than I.
58. Others do not expect too much of me.
59. I am usually nervous and easily upset.
60. I frequently find myself worrying about something.
61. People confuse me most of the time.
62. I am certainly lacking in self-confidence.
63. I worry over money and business.

PERSONAL REACTION SCHEDULE

PRS-3

64. I don't have to urinate more frequently than most people.
65. I would be a more effective person if my home life had been more pleasant.
66. At times I am full of energy.
67. I work under a great deal of tension.
68. Most of my problems stem from my relations with other people.
69. It makes me impatient to have people ask my advice or otherwise interrupt me when I am working on something important.
70. I often notice my heart pounding and I am often short of breath.
71. I like competition.
72. I often think "I wish I were a child again."
73. I'm uneasy and restless when I have to wait.
74. I never seem to get the opportunities others do.
75. I find it hard to set aside a task that I have undertaken, even for a short time.
76. My hand is often unsteady.
77. People don't make me very nervous.
78. I think a great many people exaggerate their misfortunes in order to gain the sympathy and help of others.
79. I am not easily awakened by noise.
80. I usually expect the worst from other people.
81. It makes me uncomfortable to put on a stunt at a party even when others are doing the same sort of thing.
82. As an overall evaluation of my life to this point, I would not judge myself a failure.
83. I prefer doing things to reading.
84. Often I can't understand why I have been so cross and grouchy.
85. I don't seem to do anything right.
86. I worry quite a bit over possible misfortunes.
87. I am against giving money to beggars.
88. I sweat very easily even on cool days.
89. If my problems were like other people's I could handle them.
90. I think anyone would tell a lie to keep out of trouble.
91. I like sports as a way to blow off steam.
92. I generally prefer familiar surroundings to new ones.
93. I have sometimes felt that difficulties were piling up so high that I could not overcome them.

PERSONAL REACTION SCHEDULE

PRS-4

- | | |
|--|--|
| 94. I have no more trouble with diarrhea or constipation than most people. | 106. I do not have nightmares every few nights. |
| 95. At times my thoughts have raced ahead faster than I could speak them. | 107. I am often impatient with myself. |
| 96. I do things poorly if people rush me. | 108. I find it hard to set aside a task that I have undertaken, even for a short time. |
| 97. Most people seem to get along better in life than I do. | 109. I am neither physically nor mentally equipped to live a happy life. |
| 98. I don't respect the opinions of others more than my own. | 110. I am very self-conscious in strange social settings. |
| 99. I cannot keep my mind on one thing. | 111. I am generally guilty of setting my goals too low. |
| 100. I am no more sensitive than most other people. | 112. Most nights I can go to sleep without thoughts or ideas bothering me. |
| 101. I feel uneasy and tense when I leave an important task unfinished. | 113. I am unusually self-conscious. |
| 102. I often just can't "get going." | 114. In school I used to get (do get) uneasy and worked (work) harder before a test. |
| 103. Most of the things I have done haven't been worth the effort. | 115. I do not have more personal problems than most people I know. |
| 104. It doesn't make me nervous to have to wait. | 116. I don't worry over money and business. |
| 105. I am not inclined to take things hard. | 117. I get mad at myself when I make mistakes. |

NOW GO BACK AND CHECK THE ITEM ANSWER SHEET. IF YOU HAVE LEFT ANY QUESTIONS UNANSWERED, PLEASE ANSWER THEM.

APPENDIX B

Items used from the Concept Mastery Test, Form T, part II, Analogies.

<u>Easy Items</u>	<u>Moderate Items</u>	<u>Difficult Items</u>
1	21	41
2	22	42
3	23	43
4	24	44
5	25	45
6	26	46
7	27	47
8	28	48
9	29	49
10	30	50
11	31	51
12	32	52
13	33	53
14	34	54
15	35	55
16	36	56
17	37	57
18	38	58
19	39	59
20	40	60

Name _____ Instructor _____ Section _____

Test Questionnaire

1. Had you heard anything about this test before taking it? If so, what?

2. What was your reaction to this test during the instruction period before taking it?

3. What were your reactions to this test while taking it?

4. How well do you feel you did on this test?

_____ Superior	_____ Average	_____ Below Average
_____ Above Average		_____ Poor

5. What do you think was the purpose of this test?

6. Do you have any other comments about this test?

1. Were you worried or anxious about this test ~~prior to coming to class?~~

- ☐ Very worried or anxious
- ☐ worried or anxious
- ☐ a little worried or anxious
- ☐ not worried or anxious
- ☐ felt happy and confident

2. Were you worried or anxious about this test during the instructions?

- ☐ Very worried or anxious
- ☐ worried or anxious
- ☐ a little worried or anxious
- ☐ not worried or anxious
- ☐ felt happy and confident

3. As you worked through the three sections of the test, did you become more or less anxious and worried?

- ☐ became more anxious or worried
- ☐ stayed about the same
- ☐ became less anxious or worried

4. Please check your reactions as the test became more difficult: (circle all of the alternatives that apply to you)

- A. Affected so much that it interfered with my performance on the task.
- B. A little discouraged and disgusted with myself.
- C. Determined to do better on the next section.
- D. Irritated with myself.
- E. Irritated with the experimenter.
- F. Irritated with someone or something else other than the examiner.
- G. Felt I had a reason for my poor performance.
- H. Expected to do badly anyway.
- I. Definitely challenged to do better.
- J. Felt unequal to the task.

APPROVAL SHEET

The thesis submitted by Richard Charles Evenson has been read and approved by three members of the Department of Psychology.

The final copies have been examined by the director of the thesis and the signature which appears below verifies the fact that any necessary changes have been incorporated, and that the thesis is now given final approval with reference to content, form, and mechanical accuracy.

The thesis is therefore accepted in partial fulfillment of the requirements for the Degree of Master of Arts.

4-25-66

Date

Ronald E. Walker

Signature of Adviser